

## AIR TABLE - with kit

Cat: MF0150-001 with kit

### DESCRIPTION:

The IEC Air Table is a rectangular platform 870mmx565mm that is used on the bench for friction free experiments in motion in two dimensions. The table is a timber frame with a solid bottom and top face and with inside reinforcing material to hold the surfaces very flat. Three adjustable feet permit accurate levelling of the table.

An adjustable speed air blower (LB0115-002) is a separate item and is not part of the normal kit. It supplies air into the table which passes through many small holes in the upper surface. The circular flat 'pucks' in the kit float on this air over the surface of the table.

The kit contains both large and small pucks and each can be weighted with brass discs or they can contain a magnet to make the pucks repel one another (for soft collisions). The table is complete with a sprung non-magnetic bronze restraining wire around the edges and a U shaped channel on the four sides to carry attachment screws and similar.

### MF0150-001



**Physical size:**

**Weight: kg**

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**THE AIR TABLE KIT CONTAINS:**

- 1 pce Air Table with carrying handle and air inlet fitting.
- 3 pcs Adjustable foot and wing nut.
- 2 pcs Small puck with magnet.
- 4 pcs Small puck - empty.
- 4 pcs Large puck - empty.
- Note: All pucks have foam filler pads, screws and top pins.
- 1 pr 'Velcro' type bands to suit small pucks.
- 1 pr 'Velcro' type bands to suit large pucks.
- 1 set Brass loading washers for small pucks (20x).
- 1 set Brass disc loading weights for large pucks (4x).
- 1 pce Angular acceleration attachment.
- 4 pcs Soft coil spring.
- 6 pcs Elastic band.
- 6 pcs Attachment screw and nut.
- 1 pce Pivot pin for Angular acceleration attachment.
- 1 pce Special centre pivot to allow cord to pass through centre of table.

***ASSEMBLY OF TABLE:***

Screw the wing nuts provided on the threaded stems of the three feet with the ears of the wing nut towards the plastic head. Screw the stems of the feet into the threaded sockets on the underside of the table.

Using adjustable speed Air Source (LB0115-002), fit the air source hose firmly into the fitting in the side of the Air Table.

The air source may then be switched on to blow air into the table. The air escaping from the holes in the table supports the pucks on a cushion of air and the air blower speed should be adjusted to float the pucks at the lowest speed required.

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***LEVELLING & USE OF THE TABLE:***

The easiest way to level the table is by using the pucks themselves. Perfect alignment is when the puck does not move in any particular direction when placed at any point on the table. The table is very flat and only slight drift in the position of the pucks should be apparent. Average any variations in flatness over the surface of the table. Once level, the wing nuts on the feet may be locked against the underside of the table. Check again for level and slightly adjust if necessary.

The bumper wire should have no kinks and should be evenly stretched between the bronze springs. Take care not to over stretch the springs.

Screw the square aluminium nuts part way down the threads of the special knurled screws. Guide the square nut into the channel under the rolled top edge and slide the screw down firmly.

These screws are used as general attachment points for cords during experiments and also for firing pucks from a corner of the table to the centre. Two screws should be clamped about 100mm from the one corner of the table so that a rubber band, when stretched over them, cuts across the corner of the table. By stretching the centre point of the rubber band towards the corner and releasing suddenly, a puck can be fired from the corner by the band pushing on the centre pin of the puck.

If the centre point of the rubber band is pulled back by a piece of thread, it is quite easy to reproduce the amount of stretch each time by observing the position of a knot tied on the thread relative to the table. In this way the same firing force may be approximately reproduced with various weight pucks.

***WEIGHTING OF PUCKS:***

Unscrew the metal post and separate the base from the puck body leaving the foam pad inside the body. Choose the number of weighting washers to be used and place them **EVENLY** around the foam pad. (Several layers of washers may be used.) Position the base and squeeze weights into the foam until the screw tip passes through the puck to accept the threaded top pin. The foam pad squashes tightly around the weights and holds them firmly in position. For permanent fixing, use an adhesive.

The large pucks use the brass discs for weights in a similar manner. If washers are to be used with the discs, place the washers against the foam pad with the disc over them.

The small pucks can carry approximately 100gm maximum and the large ones will support approximately 200gm. This of course depends on the volume and pressure of the air available from the air source. The weight of the puck can be written on a small label and placed face down on the inside of the puck base so that the weight will be instantly visible by looking through the base of the puck.

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***COLLISIONS:***

During collisions, only the bottom edge of the black puck bodies should come into contact and the slight flexing of the edge of the body provides elasticity during collision.

Be sure the puck base disc does not protrude past the edge of the puck body. For best experimental accuracy, puck weights should be reasonably high and the velocities of pucks should be reasonably low.

***NON ELASTIC COLLISIONS:*** For non elastic collisions, fit the 'Velcro' bands over a pair of pucks. Upon contact these bands will lock together.

***SOFT ELASTIC COLLISIONS (magnetic):*** Use the two small pucks with magnets fitted. When in proximity they will repel each other. The table is made completely of non magnetic materials and there is no risk of magnetic attraction due to outside influences.

The pucks have special markings for identification and for determining their rotational movements during experiments. This is especially important during stroboscopic photography.

***ATTACHMENTS:***

The table has provision in the centre to accept either a slim pivot pin for the angular acceleration experiment or a hollow centre pivot to allow a cord to pass through the centre of the table. At one end, the cord is attached to a puck stem and the other end of the cord is attached to a weight that hangs below.

***ANGULAR ACCELERATION ATTACHMENTS:*** This aluminium strip device joins two weighted pucks together. The hole in the pulley is used as the bearing by placing the pulley over the slim pin fitted into the table centre attachment point. A thread is fixed to the groove of the pulley by passing and tying through the hole provided and winding several turns around the groove.

The thread is then brought over the edge of the table and passed over a clamp pulley (not supplied in kit) fixed to the edge of the laboratory bench. The action of a weight attached to this thread falling towards the floor accelerates the assembly in a circular motion with a constant force.

***MAINTENANCE:*** The surface of the table should be kept clean and smooth and the flow of air from the air source should be unobstructed. For best and quietest operation, IEC's air source (LB0115-002) should be used, but if a domestic vacuum cleaner is used as the air source, take care that the dust bag inside the cleaner is not clogged. If air volume appears insufficient, the dust bag may be removed.

The table may be stored on edge or alternatively upside down resting on either the aluminium channel surround or on the heads of the attachment screws.

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